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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/727,220

12/02/2003

John C. Schultz

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EXAMINER

HUYNH, ANDY

ART UNIT

PAPER NUMBER

2818

NOTIFICATION DATE

DELIVERY MODE

03/25/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/727,220	Applicant(s) SCHULTZ ET AL.	
	Examiner ANDY HUYNH	Art Unit 2818	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 March 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-27,29-33,35-37 and 39-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-27,29-33,35-37 and 39-43 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09/10/2007</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination (RCE) under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission and Amendment filed on March 12, 2008 have been entered. In view of the Amendment, claims **3, 28, 34 and 38** have been canceled. Claims **1, 18, 26 and 39** has been amended. Claims **1, 2, 4-27, 29-33, 35-37 and 39-43** are pending in the application.

Response to Arguments

Applicant's arguments with respect to Claims **1, 2, 4-27, 29-33, 35-37 and 39-43**, filed March 12, 2008, have been fully considered but are moot in view of the new ground(s) rejection.

Information Disclosure Statement

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This office acknowledges receipt of the following items from the applicants: Information Disclosure Statement (IDS) filed 09/10/2007 and made of record. The references cited on the PTOL 1449 form have been considered.

Claim Objections

Claim **35** is objected to because of the following reasons.

At line 2, “wherein the insulative material” should read –wherein the flexible layer of electrically insulative material--.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims **1 and 18** are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims **1 and 18** recite the limitation “the electrically insulative material.” There is insufficient antecedent basis for this limitation in the claims.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims **1, 3-11, 16, 18-24, 26, 27, 29, 30, 33 and 40-43** are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,874,910 to Sugimoto et al. hereinafter

“Sugimoto” in view of US 5,882,774 to Jonza et al. hereinafter “Jonza,” Applicant’s submitted prior art (ASPA).

Regarding claims **1 and 8**, Sugimoto discloses in Figs. 1, 16, 18 and the corresponding texts as set forth in column 10, line 45-column 12, line 34, column 22, line 60-column 25, line 6, an illumination assembly/a light source apparatus 1 comprises:

a substrate comprising an electrically insulative layer/an insulating member 4 on a first side of the substrate and an electrically conductive layer/a radiator plate 3 made of thermally conductive material on a second side of the substrate;

a plurality of LED dies/chips 2, each LED die/ chip disposed in a via/a through hole 6 extending through the electrically insulative layer/the insulating member on the first side of the substrate to the electrically conductive layer/the radiator plate on the second side of the substrate, wherein each LED die/chip is electrically and thermally connected through the via/the through hole to the electrically conductive layer/the radiator plate on the second side of the substrate (Figs. 16 and 18, col. 23, lines 37-50, col. 24, lines 55-67).

Sugimoto does not explicitly disclose the electrically insulative material comprises a multilayer optical film. Jonza teaches that it is known in the art optical films are useful as polarizers and/or mirrors, and multilayer optical films have high reflectivity over a wide bandwidth (col. 1, lines 10-33). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the electrically insulative material including a multilayer optical film with Sugimoto’s device in order to achieve high reflectivity over a wide bandwidth and improve the device’s performance.

Regarding claim 4-6, Sugimoto discloses all the claimed limitations except for the via extending through the electrically insulative material is chemically etched, plasma etched, or laser milled. However, the limitations “the via extending through the electrically insulative material is chemically etched, plasma etched, or laser milled” is taken to be a product by process limitation and consider non-limitation. In a product-by-process claim, it is the patentability of the claimed product and not of the recited process steps which must be established. Therefore, when the prior art discloses a product which reasonably appears to be identical with or only slightly different than the product claimed in a product-by process claim, a rejection based on sections 102 or 103 is fair. The Patent Office is not equipped to manufacture products by a myriad of processes put before it and then obtain prior art product and make physical comparisons therewith. In re Brown, 173 USPQ 685 (CCPA 1972). Also, a product by process claim directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ I S at 17 (footnote 3). See In re Fessman, 180 USPQ 324, 326 (CCPA 1974); In re Marosi et al., 218 USPQ 289, 292 (Fed. Cir. 1983); and particularly In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985), all of which make it clear that it is the patentability of the final structure of the product "gleaned" from the process steps, which must be determined in a " product by process" claim, and not the patentability of the process. See also MPEP 2113. Moreover, an old and obvious product produced by a new method is not a patentable product, whether claimed in "product by process" claims or not.

Regarding claim 7, Sugimoto discloses the electrically conductive layer/the radiator plate on the second side of the substrate comprises a material selected from the group comprising copper, nickel, gold, aluminum, tin, lead, or a combination thereof (col. 10, line 55).

Regarding claims **9, 19, 27, 40 and 42**, Sugimoto discloses in Fig. 10 the electrically conductive layer/the radiator plate is patterned to define a plurality of electrically isolated heat spreading elements 3a, 3b, each LED die electrically and thermally coupled to an associated heat spreading element, wherein the patterned electrically conductive layer comprises an array of spaced apart heat spreading elements.

Regarding claims **10-11, 16 and 33**, Sugimoto discloses the illumination assembly further comprises a heat dissipation assembly disposed adjacent the second side of the substrate wherein the heat dissipation assembly is separated from the second side of the substrate by a layer of material that is thermally conductive (Fig. 18, col. 24, line 64-col. 25, line 4).

Regarding claims **12-15 and 17**, Sugimoto discloses the claimed limitations except for the thermally conductive, material is an adhesive; wherein the thermally conductive, adhesive material is a polymer adhesive loaded with boron nitride; wherein the thermally conductive, material is non-adhesive; wherein the thermally conductive, non-adhesive material is a polymer loaded with silver particles; and wherein the thermally conductive member comprises a material selected from the group comprising metals and polymers. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to select either one of the thermally conductive materials as above, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. In re Leshin, 125 USPQ 416.

Regarding claims **18 and 20-22**, Sugimoto discloses in Figs. 1, 16 and 18 and the corresponding texts as set forth in column 10, line 45-column 12, line 34, column 22, line 60-column 25, line 6, an illumination apparatus/a light source apparatus 1 comprises:

a substrate having an electrically insulative layer/an electrically insulating member 4 on a first surface and an electrically conductive layer/a radiator plate 3 made of thermally conductive material on a second surface, a plurality of mounting vias/through holes 6 extending through the electrically insulating layer to the electrically conductive layer/the radiator plate;

a plurality of light emitting elements/LED chips 2 disposed in the plurality of mounting vias/through holes, wherein the light emitting elements are electrically and thermally connected to the electrically conductive layer through the mounting vias/through holes (Figs. 16 and 18, col. 23, lines 37-50, col. 24, lines 55-67).

Sugimoto does not explicitly disclose the electrically insulative material comprises a multilayer optical film. Jonza teaches that it is known in the art optical films are useful as polarizers and/or mirrors, and multilayer optical films have high reflectivity over a wide bandwidth (col. 1, lines 10-33). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the electrically insulative material including a multilayer optical film with Sugimoto's device in order to achieve high reflectivity over a wide bandwidth and improve the device's performance.

Regarding Claims **23, 29 and 30**, Sugimoto discloses in Fig. 16 the illumination apparatus of further comprising a plurality of wirebond vias 4e extending through the electrically insulating layer 4 to the electrically conductive layer, each wirebond via exposing a corresponding wirebond connection pad of the electrically conductive layer.

Regarding claim **24**, Sugimoto discloses in Fig. 1 the illumination apparatus/the light source apparatus further comprises a thermally conductive encapsulant/a sealing rein 10 contacting the light emitting elements and electrically insulating layer.

Regarding claim **26**, Sugimoto discloses in Figs. 1, 10, 16, 18 and the corresponding texts as set forth in column 10, line 45-column 12, line 34, column 22, line 60-column 25, line 6, an illumination assembly/a light source apparatus 1 comprises:

- a layer of an electrically insulative layer/an insulating member 4;

- a layer of thermally and electrically conductive material/a radiator plate 3 disposed on a bottom surface of the layer of insulative material, the conductive material/the radiator plate patterned to form a plurality of adjacent heat spreading elements 3a, 3b (Fig. 10);

- a plurality of vias/through holes 5', 6 in the insulative layer/the insulating member, each via extending through the insulative material to an associated heat spreading element;

- a plurality of light emitting elements/LED chips 2, each light emitting element/LED chip disposed in one of vias/through holes, each light emitting element/LED chip is electrically and thermally connected to the heat spreading element associated with via/the through hole (Figs. 10, 16 and 18, col. 23, lines 37-50, col. 24, lines 55-67).

Sugimoto does not explicitly disclose the electrically insulative material comprises a multilayer optical film. Jonza teaches that it is known in the art optical films are useful as polarizers and/or mirrors, and multilayer optical films have high reflectivity over a wide bandwidth (col. 1, lines 10-33). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the electrically insulative material including a

multilayer optical film with Sugimoto's device in order to achieve high reflectivity over a wide bandwidth and improve the device's performance.

Regarding claims **41 and 43**, Sugimoto discloses in Fig. 23(f) each LED die is electrically connected to at least two adjacent/adjacent spaced apart heat spreading elements.

Claims **2, 25, 31 and 32** are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,874,910 to Sugimoto et al. hereinafter "Sugimoto" in view of US 5,882,774 to Jonza et al. hereinafter "Jonza," Applicant's submitted prior art (ASPA), further in view of US 2003/0052594 A1 dated 03/20/2003 filed 09/17/2002 to Matsui et al. hereinafter "Matsui."

Sugimoto and Jonza disclose all the claimed limitations as above except for the substrate is flexible. Matsui teaches that a flexible substrate is used in a lighting apparatus for the flexibility. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to use a flexible substrate in a lighting apparatus for the flexibility as taught by Matsui.

Claims **35-37 and 39** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wada Kazunobu (FR 2662896 dated 12/06/1991) in view of US 5,882,774 to Jonza et al. hereinafter "Jonza," Applicant's submitted prior art (ASPA).

Regarding Claims **35-37 and 39**, Wada Kazunobu discloses in Fig. 5 and the corresponding texts as set forth on page 6, line 23-page 7, line 26, a flexible circuit comprising:

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a flexible layer of electrically insulative material 41;

a flexible layer of electrically conductive material 33, 48, 49 disposed on a first surface of the insulative material, the conductive material patterned to form a plurality of adjacent heat spreading elements, each heat spreading element having a first electrical connection pad and a second electrical connection pad;

a plurality of mounting vias extending through the insulative material wherein each mounting via exposes the first electrical connection pad of an associate heat spreading element.

Wada Kazunobu discloses the claimed limitations except for the insulating material comprising an at least partially reflective multilayer optical film, wherein the multilayer optical film is shaped into a non-planar structure. Jonza teaches that it is known in the art optical films are useful as polarizers and/or mirrors, and multilayer optical films have high reflectivity over a wide bandwidth (col. 1, lines 10-33). It would have been obvious to one of ordinary skill in the art at the time of the invention was made to provide the electrically insulative material including a multilayer optical film with Kazunobu's device in order to achieve high reflectivity over a wide bandwidth and improve the device's performance. And, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to form the multilayer optical film being shaped into a non-planar structure, since such a modification would have involved a mere change in the shape of the multilayer optical film. A change in shape is generally recognized as being within the level of ordinary skill in the art.

Conclusion

A shortened statutory period for response to this action is set to expire 3 (three) months and 0 (zero) day from the day of this letter. Failure to respond within the period for response will cause the application to become abandoned (see M.P.E.P 710.02(b)).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andy Huynh, (571) 272-1781. The examiner can normally be reached on Monday-Friday from 6:30 AM to 3:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Loke can be reached on (571) 272-1657. The Fax number for the organization where this application or proceeding is assigned is (571) 273-8300. Any inquiry of a general nature or relating to the -status of this application or proceeding should be directed to the receptionist whose phone number is (703) 308-0956.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Andy Huynh/

Primary Examiner, Art Unit 2818